

THE MARYLAND AGRICULTURAL EXPERIMENT STATION

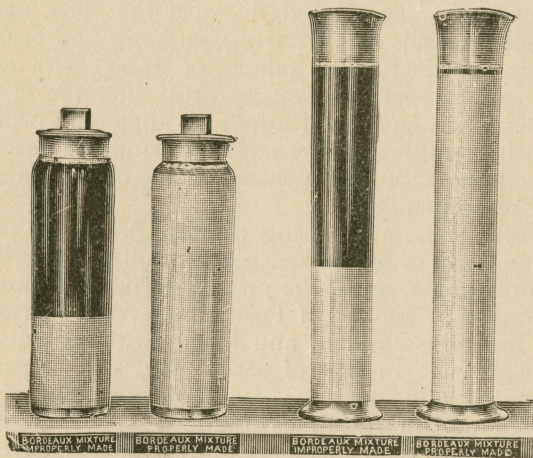
STATE HORTICULTURAL DEPARTMENT.

CIRCULAR BULLETIN No. 40.

MARCH, 1902.

THE WHY OF SPRAYING.

By Frederick H. Blodgett, Assistant State Pathologist.



Properly made Bordeaux does not settle rapidly when allowed to stand quietly, as here shown.

a solution of copper sulphate, and is the standard fungicide. The spraying should be so done as to dampen the plants as with a fog, rather than wet them by a shower of drops.

Spraying is a means of insurance against the injury of valuable plant products by pests. Many of the injurious pests are themselves minute plants, which grow on plants instead of on earth, and produce spores instead of seeds. These minute plants are fungi, and are the cause of fruit rot, of leaf curl, and of many other diseases. The spores are killed at germination, if they touch a solution of copper sulphate. Bordeaux mixture is largely

DOES IT PAY?

Carefully recorded experiments at different points all over the country prove that spraying pays. 1. A higher grade of fruit is obtained, hence higher prices are received. The individual fruits are larger, firmer and of a better color, and are free from sooty or other surface blotches due to fungi. 2. More fruit is obtained, hence larger cash returns. The total yield of fruit at picking time is greater on the sprayed than on the unsprayed trees. 3. Less fallen fruit. The premature dropping and "windfalls" both decrease when spraying is intelligently done. 4. The fruit keeps longer. The presence of scab on apples is an aid to decay; its absence a source of safety, for the rough surface affords easy lodgement for the spores of rot fungi.

5. The tree itself is healthier. This is shown by the deeper green foliage, the better character of growth made, and follows from the fact that the tree is able to live without interference by fungi. 6. The crops of the next year are better. The healthy foliage is able to prepare, and the healthy tree to store up food materials, which are used by the buds the following spring.

In short, spraying enables the intelligent grower to secure better crops, both in quantity and in quality, and more regularly than is possible without the spraying. *Properly done, spraying pays.* To realize the greatest benefit from spraying one needs to know what to spray for and what to use.

WHEN TO SPRAY.

When possible, it is advisable to spray once before the buds start in the spring. This destroys any spores lodging near the buds, and enables them to start right. For this first spraying, on apple and pear, use copper sulphate (four pounds to fifty gallons of water) with no lime. This is very beneficial to apple for scab and rot. For the first spraying of peach and plum, and later applications on apple and pear, use Bordeaux of standard strength. In the later sprayings of peach and Japanese plum, three pounds of the sulphate to nine of lime, and fifty gallons of water, are recommended.

Spray early, before the buds start, using regular Bordeaux on peach and plum, copper sulphate on apple and pear, to kill any spores already on the trees. Spray again, using the proper strength of Bordeaux, with addition (in case of apples) of Paris green, one-quarter pound per barrel, after the blossoms fall, and again, without Paris green, when fruit is half grown. In case of peach, final spraying of copper acetate, as the fruits begin to color. *Do not spray when in bloom*, as Bordeaux kills the pollen as well as fungi.

The results obtained will depend upon (1) thoroughness—cover every part with a film of Bordeaux; (2) care in making—properly made Bordeaux will stick better and longer than poorly prepared; (3) fineness of spray—use a nozzle that makes a fog of the liquid instead of squirting or sprinkling it, and keep the nozzle moving about among the branches; (4) time of spraying—prevent the start of fungi by keeping a film of Bordeaux on the leaves and fruit; (5) brains—use these in connection with each of these items, especially with (2) and (4). Spray more frequently in damp, muggy weather than in clear and sunny periods, for warm, damp days help the development of fungi; spraying checks their development.

WHAT TO SPRAY.

Spray all fruit trees as already indicated. The probable range of returns from sprayed trees will be from twenty-five to one hundred per cent more than from unsprayed, and often means a good crop in place of complete loss.

Spray tomato plants for the fruit rot, spraying when fruit is small, and repeating once a fortnight in damp weather.

Spray lima beans for mildew and other diseases. Thus a valuable vegetable or truck crop may be made profitable, when otherwise practically nothing would be obtained.

Spray celery for leaf blight.

Spray each plant from which you expect to receive profits, provided there is danger of injury by fungi. Some plants, corn and wheat for instance, are often injured by fungi, but it is not necessary to spray such, although profits are expected from them.

FORMULAE.

Copper sulphate:—Four pounds of copper sulphate to fifty gallons of water, for use before buds start on apple and pear.

Bordeaux mixture (regular):—For use on apple and pear regularly, and on peach and plum before buds start; four pounds of copper sulphate, six pounds of quick lime and fifty gallons of water.

Bordeaux mixture (special):—For use on peach and plum after blooming; three pounds of copper sulphate, nine pounds of quick lime and fifty gallons of water.

In preparing Bordeaux, make two solutions, twenty-five gallons each, one containing four pounds copper sulphate, and the other six pounds lime. Pour *at the same time* from each into a barrel or tank and stir well. Use as soon as made. Use only wooden or copper vessels and tanks (barrels).

Copper acetate:—For use on peaches, when they begin to color, six ounces of copper acetate to fifty gallons of water; stir well.

COST OF CHEMICALS.

Copper sulphate in barrel lots at \$.05 per lb. (Jan. '02.)

Lime, from local dealer, about one-quarter cent per pound. Get a good grade.

Copper acetate in five pound lots at \$.45 per lb. (Jan. '02.)

Cost per barrel of spray mixtures:—Bordeaux mixture \$.32, (copper sulphate \$.30, lime about 1½c.); copper acetate \$.18.

Do not use old Bordeaux. Ready-made Bordeaux preparations are of little value; make your own, and use it as soon as made.

PUMP.

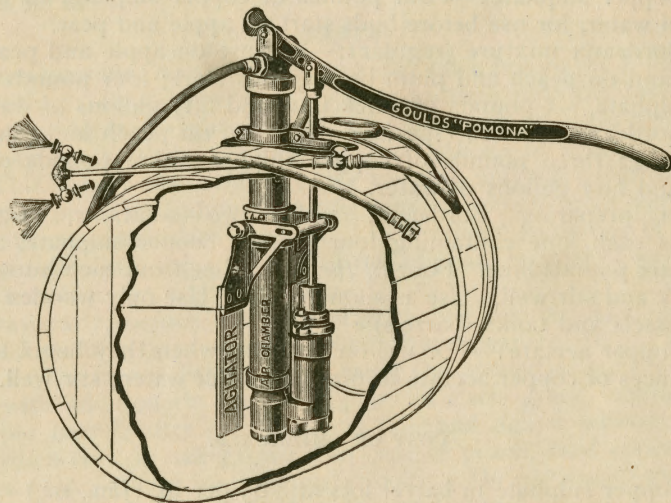
The pump should have brass valves and working parts, which could be easily inspected, and be provided with a good agitator. It should be fitted on end of barrel, and have two twenty or twenty-five foot leads of hose and Vermorel or Cyclone nozzles. Use extension poles, so as to get nozzles close to upper branches. A good barrel pump, etc., complete, should not be more than \$22.00, and are as essential as a good cultivator or seeder, costing as much. Smaller pumps are much cheaper.

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No particular pump is recommended. Those of the Demming Co., and of the Gould Manufacturing Co., are thoroughly satisfactory, and may be obtained direct from them, or through Griffith & Turner Co., Baltimore.

Further details in regard to the nature of fungi, apparatus for spraying, and some of the special diseases, are available in previous circulars, and in the Experiment Station Bulletins, any of which will be sent on request to those who do not have them.

This Department will be glad to answer any questions, and to aid the fruit grower in combatting plant diseases.



A good spray pump with double "Vermorel" and extension rod for fruit tree spraying.
Made either for side or end of barrel.